

Saskatchewan-North Dakota Trans-Boundary Ambient Monitoring Network

Air Quality Report

1st Quarter 2001

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Introduction

The Saskatchewan (SK) - North Dakota (ND) Trans-Boundary Ambient Monitoring Network is a cooperative effort among Environment Canada (EC), US Environmental Protection Agency (EPA), Saskatchewan Environment Resource Management (SERM), North Dakota Department of Health (NDDH), and SaskPower. The working participants are SaskPower (Boundary Dam Power Station) and NDDH (Division of Air Quality). After the initial data sharing details are worked out, data collected by SaskPower at the Boundary Dam Power Station (BDPS) and continuous $PM_{2.5}$ data at Estevan will be included in this quarterly report.

Section One provides a description of the data collected, by pollutant, and a brief summary of data and any significant action(s) that may affect the data. Section Two presents the data in summary tables comparing the data to the applicable North Dakota and US ambient air quality standards. Section Three lists any exceedance of the North Dakota ambient air quality standards first by site and date, then by date and site.

SECTION ONE

DISCUSSION OF MONITORING RESULTS

Sulfur Dioxide (SO₂)

There were no exceedances of the ND state or US federal standards during the quarter. The maximum 1-hour concentration was 154 ppb on March 12 at Short Creek; the maximum 3-hour concentration was 41 ppb on March 18 at Short Creek; and, the maximum 24-hour concentration was 11 ppb on January 17 at Short Creek. An 80% data recovery was achieved for the period operated.

Sulfur Dioxide (SO₂) 5-Minute Average

The maximum 5-minute concentration was 385 ppb on March 21 at Short Creek.

Nitrogen Dioxide (NO₂)

The maximum 1-hour concentration observed was 28 ppb on January 17 at Short Creek. An 80% data recovery was achieved for the period operated.

Inhalable Continuous PM_{2.5} Particulates

The maximum 1-hour concentration was 49.4 µg/m³ on March 5 at Short Creek; the maximum 24-hour concentration was 6.9 µg/m³ on February 13 at Short Creek. An 80% data recovery was achieved for the period operated.

Inhalable FRM PM_{2.5} Particulates

The maximum 24-hour average concentration was 22.3 µg/m³ on February 8 at Estevan. All sites achieved an 80% data recovery for the period operated.

Inhalable PM₁₀ Particulates

There was no exceedance of the 24-hour ND state standard during the quarter. The maximum 24-hour average concentration was 13.3 µg/m³ on January 31 at Short Creek. An 80% data recovery was achieved for the period operated.

Inhalable PM₁₀ Sulfates (SO₄)

The purpose for sulfate analysis is to aid in assessing the impact of SO₂ emissions on inhalable particulate concentrations and visibility. The maximum 24-hour PM₁₀ sulfate concentration was 3.1 µg/m³ on January 13 at Short Creek. An 80% data recovery was achieved for the period operated.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD	2ND MM/DD				
Short Creek - SPM	2000	OCT-DEC	2183	53 12/26/00	46 10/17/12	27 12/25/23	24 12/26/02	8 11/29	5 12/26	2.0			24.9

The maximum 1-hour concentration is 53 ppb at Short Creek - SPM on 12/26/00
The maximum 3-hour concentration is 27 ppb at Short Creek - SPM on 12/25/23
the maximum 24-hour concentration is 8 ppb at Short Creek - SPM on 11/29

* The air quality standards are:

ND STATE Standards -

- 1) 273 ppb maximum 1-hour average concentration.
- 2) 99 ppb maximum 24-hour average concentration.
- 3) 23 ppb maximum annual arithmetic mean concentration.

US FEDERAL Standards -

- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
- 3) 30 ppb annual arithmetic mean.

Sask. Provincial Standards -

- 1) 0.17 ppm maximum 1-hour concentration not to be exceeded more than once per year.
- 2) 0.06 ppm maximum 24-hour concentration not to be exceeded more than once per year.
- 3) 0.01 ppm annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	5 - M I N U T E		M A X I M A		# HOURS >600	% >MDV
				1ST DATE MM/DD/HH	2ND DATE MM/DD/HH	3RD DATE MM/DD/HH			
Short Creek - SPM	2000	OCT-DEC	2183	74 11/29/07	72 10/17/12	67 12/26/00		0	35.2

The maximum 5-minute concentration is 74 ppb at Short Creek - SPM on 11/29/07

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR		ARITH MEAN	% >MDV
				1ST MM/DD/HH	2ND MM/DD/HH		
Short Creek - SPM	2000	OCT-DEC	2180	24 11/29/07	24 12/26/00	3.4	83.0

The maximum 1-hour concentration is 24 ppb at Short Creek - SPM on 11/29/07

- * The air quality standards are:
 ND STATE - 53 ppb maximum annual arithmetic mean.
 US FEDERAL - 53 ppb annual arithmetic mean.
 Sask. Provincial Standards are:
 1) 0.2 ppm not to be exceeded.
 2) 0.05 ppm annual average.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous PM_{2.5} (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR		24 - HOUR				MEAN	1HR #>150	24HR #>65
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD	2ND MM/DD	3RD MM/DD	4TH MM/DD			
Short Creek - SPM	2000	OCT-DEC	2187	33.9 10/18/17	29.6 10/21/19	14.8 10/12	8.1 10/11	7.5 10/21	6.6 10/10	2.8		

The maximum 1-hour concentration is 33.9 µg/m³ at Short Creek - SPM on 10/18/17
 The highest 24-hour concentration is 14.8 µg/m³ at Short Creek - SPM on 10/12

- * The ambient air quality standards are:
 US FEDERAL Standards -
 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
 2) Annual: 3-year average not to exceed 15 µg/m³.

Canadian-Wide Standard -
 24-hour: 3-year average of 98th percentiles not to exceed 30 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable FRM PM_{2.5} Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#> 65	AM>15	%>MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Estevan, SK	2000	NOV-DEC	7 ***	5.0	13.9 11/23	13.4 12/12	7.5 11/30	8.7			100.0
Lignite - SPM	2000	OCT-DEC	14	2.3	11.2 10/21	9.3 12/14	9.1 11/14	5.3			100.0
Raferty Dam, SK	2000	OCT-DEC	13	2.0	11.8 12/14	7.7 10/21	7.3 11/14	5.5			100.0
Short Creek - SPM	2000	OCT-DEC	15	2.1	9.8 12/14	8.8 10/21	7.6 11/14	5.1			100.0

The maximum 24-hour concentration is 13.9 µg/m³ at Estevan, SK on 11/23

* The ambient air quality standards are:

US FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

Canadian-Wide Standard -

24-hour: 3-year average of 98th percentiles not to exceed 30 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM₁₀ Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>150	AM>50	%>MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Short Creek - SPM	2000	OCT-DEC	11 ***	4.0	33.8 10/21	17.2 10/09	16.3 12/20	12.2			100.0

The maximum 24-hour concentration is 33.8 µg/m³ at Short Creek - SPM on 10/21

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m³ expected annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM₁₀ Sulfates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>15.	AM>5.	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Short Creek - SPM	2000	OCT-DEC	11 ***	0.4	2.8 12/14	2.6 12/26	1.7 10/09	1.4			81.8

The maximum 24-hour concentration is 2.8 µg/m³ at Short Creek - SPM on 12/14

* No standard is currently in effect.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE